

CLAIMS

1. A method for modifying contractility of the heart of a patient, comprising:
receiving signals from a sensor coupled to the body of the patient indicative of physiological activity;
5 analyzing the signals to derive a measure of the physiological activity;
applying excitable tissue control (ETC) stimulation to the heart so as to enhance contractility of the heart muscle responsive to the measure.
2. A method according to claim 1, wherein applying the stimulation comprises applying electrical signals to stimulate the heart and controlling intensity of the signals responsive to the
10 measure.
3. A method according to claim 2, wherein controlling the intensity comprises regulating a duty cycle of the signals relative to a beat rate of the heart.
4. A method according to claim 1, wherein applying the stimulation comprises assessing the measure so as to determine in which of a plurality of predetermined ranges the measure
15 falls, and varying the application of the ETC stimulation dependent on the range.
5. A method according to claim 4, wherein assessing the measure comprises setting upper and lower thresholds with respect to the measure, and wherein varying the application of the stimulation comprises holding off the stimulation when the measure is outside a range between the thresholds.
- 20 6. A method according to claim 4, wherein assessing the measure comprises associating one or more of the ranges with respective types of physical activity undertaken by the patient, and wherein varying the application comprises adapting the stimulation to a demand level associated with the physical activity.
7. A method according to claim 6, wherein adapting the stimulation comprises increasing
25 the stimulation responsive to an increasing demand level.
8. A method according to claim 6, wherein adapting the stimulation comprises decreasing the stimulation responsive to an increasing demand level.
9. A method according to any of the preceding claims, wherein analyzing the signals comprises deriving a measure of hemodynamic stress.
- 30 10. A method according to any of claims 1-8, wherein the measure comprises a heart rate.

11. A method according to any of claims 1-8, wherein receiving the signals comprises receiving a signal responsive to motion of the patient.
12. Apparatus for stimulating cardiac tissue in the body of a patient, comprising:
at least one sensor, coupled to the body which generates signals indicative of
5 physiological activity;
one or more stimulation electrodes, which are placed in contact with the heart; and
an electrical control unit, which receives and analyzes the signals from the sensor so as
to derive a measure of the physiological activity and which applies an excitable tissue control
(ETC) signals to the stimulation electrodes so as to enhance contractility of the heart muscle
10 responsive to the measure.
13. Apparatus according to claim 12, wherein the control unit varies an intensity of the signals responsive to the measure.
14. Apparatus according to claim 13, wherein the control unit varies the intensity by regulating a duty cycle of the signals relative to a beat rate of the heart.
- 15 15. Apparatus according to claim 12, wherein the control unit assigns the measure to one of a plurality of predetermined ranges and varies the application of the ETC signals dependent on the range.
16. Apparatus according to claim 15, wherein the control unit holds off application of the signal when the measure is outside a range between predetermined lower and upper thresholds.
- 20 17. Apparatus according to claim 15, wherein one or more of the ranges are associated with respective types of physical activity undertaken by the patient, and the control unit adapts the stimulation to a demand level associated with the physical activity.
18. Apparatus according to claim 17, wherein the control unit increases the stimulation responsive to an increasing demand level.
- 25 19. Apparatus according to claim 17, wherein the control unit decreases the stimulation responsive to an increasing demand level.
20. Apparatus according to any of claims 12-19, wherein the measure comprises a measure of hemodynamic stress.
21. Apparatus according to any of claims 12-19, wherein the measure comprises a heart
30 rate.

22. Apparatus according to any of claims 12-19, wherein the at least one sensor comprises an accelerometer.
23. Apparatus according to any of claims 12-19, wherein the at least one sensor comprises a sensing electrode.
- 5 24. Apparatus according to claim 23, wherein the sensing electrode comprises one of the stimulation electrodes.
25. A method for cardiac rehabilitation therapy, comprising:
receiving signals from a sensor coupled to the body of a patient indicative of physiological activity;
10 analyzing the signals to derive a measure of the physiological activity, the measure having a range of values;
associating the values of the measure with levels of physical activity undertaken by the patient;
applying electrical stimulation to the heart so as to induce muscular exertion thereof
15 responsive to the level, such that over at least a part of the range, the stimulation is adjusted to reduce the muscular exertion of the heart responsive to an increase in the level of activity.
26. A method according to claim 25, wherein applying the stimulation comprises inducing exertion of the heart while the patient is at rest and reducing the exertion when the patient is active.
- 20 27. A method according to claim 25 or 26, wherein applying the stimulation comprises applying excitable tissue control (ETC) stimulation to the heart so as to enhance contractility of the heart muscle.